



THE UNIVERSITY OF
CHICAGO

Computational and Applied Mathematics
&
Statistics Student Seminar

Kingsley Yeon

Computational and Applied Mathematics
University of Chicago

Deep Univariate Polynomial and Conformal Approximation

Tuesday, November 7, 2023

12:30 PM

Jones Laboratory,

Jones 303

ABSTRACT

We present a novel approach in approximation theory, which involves approximating a univariate function using deep polynomial approximations. Inspired by the success of deep neural networks, a deep approximation is defined as a composite function composed of multiple layers of simple functions. We will elucidate the theoretical underpinnings of this approach by examining its effectiveness in mitigating the Runge phenomenon and exploring the serpentine properties of deep approximations. Moreover, our computational experiments, incorporating two and three polynomial layers, demonstrate that this methodology yields more accurate approximations compared to a single polynomial with an equivalent number of degrees of freedom (coefficients).